

MAGNESIUM-BASED CASTING ALLOYS HAVING IMPROVED
ELEVATED TEMPERATURE PERFORMANCE, OXIDATION-RESISTANT
MAGNESIUM ALLOY MELTS, MAGNESIUM-BASED ALLOY CASTINGS PREPARED
THEREFROM AND METHODS FOR PREPARING SAME

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ABSTRACT OF THE INVENTION

A magnesium-based casting alloy having good salt-spray corrosion resistance and improved creep resistance, tensile yield strength and bolt-load retention, particularly at elevated temperatures of at least 150°C, is provided. The inventive alloy comprises, in weight percent, 2 to 9% aluminum and 0.5 to 7% strontium, with the balance being magnesium except for impurities commonly found in magnesium alloys.

A method of making an oxidation-resistant alloy melt, and the alloy melt prepared by such a method, are also provided. The alloy melt comprises magnesium as a primary alloying metal, and aluminum and strontium as secondary alloying metals, while the inventive method comprises: melting the alloying metals under an atmosphere of an inert gas selected from a mixture of carbon dioxide and sulfur fluoride gas, a mixture of nitrogen and sulfur dioxide gas, and combinations thereof.

Further provided is a method of making a magnesium-based alloy casting from the above-identified alloy melt, and the alloy casting prepared by such a method.

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